SUBJECT: Cervical Spine Evaluation and Clearance Clinical Management Guideline

RECOMMENDATION(S): Dr. Ron Robertson/Dr. Ben Davis **APPROVAL:** 07/01/2015

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PURPOSE: To provide guidelines for the diagnostic evaluation and subsequent clearance of cervical spine injuries in the traumatically injured patient and to standardize these procedures across all services and phases of care.

DEVIATIONS: Deviations from these standards require attending involvement and preferably discussion.

INCLUSIONS: Trauma patients presenting to UAMS with spinal injuries *without known or suspected cord involvement.*

EXCLUSIONS: Suspicion or evidence of spinal cord injury (see separate SCI guideline).

CONSULTATION: Spine team should be notified immediately upon *confirmation* of spinal cord injury.

GENERAL CONSIDERATIONS:

1. Radiologic clearance of the cervical spine should occur only after hemodynamic, respiratory, and surgical stabilization of the patient is complete. During such stabilization the cervical spine should be kept immobilized.
2. Penetrating trauma does not require a C-collar unless accompanied by significant blunt trauma or suspicion of penetrating injury to the spine.
3. Field c-spine collar to be replaced by an aspen collar as soon as patient safety allows.
4. No more than one attempt at c-collar clearance should be made in a day.

RISK STRATIFICATION:

1. LOW-RISK: A patient may be considered low risk if ALL of the following are TRUE:
    a. No posterior midline cervical pain/tenderness
    b. Normal mental status (no confounding TBI, intoxication, shock)
    c. No historical or physical exam evidence of focal neurological deficit
    d. No significant distracting injury (Note that if patient is able to concentrate and comply with exam, the injury is not "distracting.")
    e. Low-energy mechanism; low-speed MVC, bicycle collision, fall from standing
2. HIGH-RISK: A patient may be considered high risk if ANY of the following are TRUE
    a. Presence of posterior midline cervical tenderness
    b. Abnormal mental status (regardless of cause).
    c. Historical or physical exam evidence of focal neurological deficit
    d. Significant distracting injury (patient unable to cooperate/comply for examination)
    e. High-energy mechanism; high speed MVC/MCC, ejection, rollover, collision with a large vehicle, significant vehicular intrusion, death at the scene.

IMAGING:

1. No role for plain films in the initial assessment of cervical spine injuries
2. LOW-RISK patients may be cleared clinically (see below)
3. HIGH-RISK patients should receive a dedicated, non-contrasted CT cervical spine from occiput to T1 with sagittal and coronal reconstructions.
    a. If the patient is to be admitted to the hospital, c-spine clearance can await final attending read.
    b. If the patient is to otherwise be discharged, a FINAL, ATTENDING READ should be requested by contacting the radiology resident on call.
4. MRI has no *routine* role in the management of c-spine clearance. Obtunded patients with a normal CT c-spine (per final, attending read) AND without history or physical examination evidence of spinal cord injury may have their collar removed.
5. MRI may be required if CT spine is negative but history and physical suggests a focal neurological deficit (see separate spinal cord injury guideline)

DISPOSITION:

1. Patients with un-cleared c-spines shall be dispositioned on the basis of other injuries.
2. Those patients who cannot be clinically cleared for pain or limited range of motion should receive a CT scan as described above.
3. In the absence of other indications for inpatient admission, a patient with a negative CT c-spine *per final, attending read* may go home with the c-collar in place.
    a. If patient was activated as a level 1 or 2 trauma, make appointment for clearance in trauma clinic two weeks after discharge
        i. If patient cannot be cleared at two weeks, an outpatient spine consult is needed
    b. If a patient was a level 3 activation or not activated as a trauma, make appointment for clearance in consulting spine clinic two weeks after discharge.
        i. If NSGY was consulted: please send to Monday NSGY resident clinic
        ii. If ORTHO SPINE was consulted: please send to consulting attending's clinic

Cervical Spine Clearance Procedure:

1. General Considerations:
    a. If spine team is following for a concomitant thoracolumbar of spinal cord injury, that team should perform the c-spine clearance exams.
    b. Every attempt to clear c-spine should be documented in Epic (see dotphrase below)
    c. No more than one attempt should be made in a day.
    d. Clearance testing should be done as soon as safe and feasible.
2. Qualified Examiners: Physicians, APNs, or PAs who have:
    a. Observed the clearance procedure at least once
    b. Reviewed these guidelines
    c. Been proctored by a qualified examiner for two examinations.
    d. Have access to Epic for order writing and documentation purposes.
3. Clearance Examination

a. Assess mental status and ability of patient to comply with exam
b. Instruct patient to notify you of any *posterior, midline* pain
c. Instruct patient to not move head until told to do so
d. With collar in place, palpate posterior cervical midline for gross deformity
e. Instruct patient to go through the ranges of motion (flexion, extension, lateral rotation) and report any posterior midline pain/discomfort as well as any neurological symptoms
f. Remove c-collar if appropriate
g. Place c-collar clearance note in Epic (see suggested dotphrase in Appendix 1)
h. Place "d/c c-collar order" in Epic
i. No further imaging is necessary unless symptoms occur.

REFERENCES:

1. Practice Management Guideline/Eastern Association for the Surgery of Trauma
2. Hoffman JR, Wolfson AB, Todd K, Mower WR (1998). "Selective cervical spine radiography in blunt trauma: methodology of the National Emergency X-Radiography Utilization Study (NEXUS)". Ann Emerg Med. 32 (4): 461–9. *doi*:*10.1016/s0196-0644(98)70176-3*. *PMID* *9774931*.
3. Stiell, IG *et al.* "The Canadian C-Spine Rule for Radiography in Alert and Stable Trauma Patients." JAMA. 2001;286(15):1841-1848. doi:10.1001/jama.286.15.1841

APPENDIX I:

Proposed c-spine clearance Epic dotphrase (to be used only when c-spine cleared);

C-spine clearance note:

C-collar in place.

High quality dedicated CT cervical spine shows no acute cervical fractures, evidence of injuries to cord, or injuries to spinal ligaments per final attending radiologist read.

Patient is awake and alert, able to understand and follow commands.

C-spine is non-tender to palpation in the posterior midline, no step-offs or other gross deformities of the cervical spine are present.

Full active range of motion of the cervical spine (flexion, extension, lateral rotation) completed without pain, discomfort, or paresthesias. Passive range of motion was not performed.